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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/668,441	09/23/2003	Bingjie Miao	BEA9-2003-0018-US1	2347
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LIEBERMAN & BRANDSDORFER, LLC 802 STILL CREEK LANE GAITHERSBURG, MD 20878			EXAMINER CAO, PHUONG THAO	
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			2164	

DATE MAILED: 09/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/668,441	Applicant(s) MIAO, BINGJIE	
	Examiner Phuong-Thao Cao	Art Unit 2164	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☒ This action is **FINAL**.      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-15 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-15 and 17-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. This action is in response to Amendment filed on 6/19/2006.
  2. Claims 1, 7, 13 and 14 have been amended, and claims 3 and 16 have been canceled.
- Currently, claims 1-2, 4-15 and 17-19 are pending.

### ***Response to Arguments***

3. Regarding Applicant's statement that Lindsay et al. does not include each of the dimension tables rooted at a first level child dimension table into the logical node, Lindsay et al. teach a snowflake including snowflake root node and snowflake subnodes (see [column 7, lines 45-55] and Fig. 6) wherein snowflake is interpreted as logical node, snowflake root node (R) as first level child dimension table, and snowflake subnodes (A, B, C and D) as all other dimension tables rooted at the first level child dimension table. Lindsay et al. also teach the pushing down or joining the snowflake including only an optimal set of nodes (or dimension tables) to the fact table (see [column 7, lines 25-35] and Fig. 6). However, Examiner agrees with the Applicant that Lindsay et al. does not teach pushing down a logical node to the fact table including all dimension tables rooted at the first generation child dimension table in the logical node.

### ***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Art Unit: 2164

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-2 and 4-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claims 1-2 and 4-6, these claims recite the method of optimizing a snow flake query, but fails to recite a tangible result, a requirement for compliance with the provisions of 35 U.S.C. § 101 in view of the Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility, published on 26 October 2005, which can be found at [http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101\\_20051026.pdf](http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf), particularly with respect to ANNEX IV Computer-Related Nonstatutory Subject Matter, beginning on page 50.

For a result to be tangible, it must be more than just a thought or a computation; it must have real-world value rather than an abstract result. For instance, a tangible result can include storing or displaying result data so that it can be accessed and used.

Regarding claims 7-12, these claims are “system” claims but recite no hardware in its limitations. A “system” claim is required to have software tangibly embodied on hardware. “Database”, “tables”, “logical node” or “optimizing module” implemented by program instructions are considered as software. Hardware may include memory, storage devices, processing system, etc.

*Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 7-15 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Lindsay et al. (US Patent No 6,105,020).

As to claim 7, Lindsay et al. teach:

“A system for optimization of snow flake query” (see [column 3, lines 1-22]) comprising:

“a database having a fact table, and at least two child dimension tables” (see [column 4, lines 60-67] and [column 6, lines 9-15]);

“a logical node comprised of a child dimension table rooted at the fact table with all dimension tables rooted to said child dimension table” (see [column 6, lines 10-25] and [column 7, lines 45-55] and Fig. 6 wherein each snowflake including a snowflake root table (R) and snowflake subnodes (A, B, C, D) is equivalent to Applicant’s “logical node”); and

“an optimization module adapted to push down said logical node to said fact table for execution of a query of said database” (see [column 7, lines 20-67], [column 8, lines 1-60] and Fig. 6 wherein snowflake including a snowflake root table and snowflake subnodes is equivalent

to Applicant's logical node, and the including or joining the snowflake to the minimum spanning tree is equivalent to Applicant's "push down to said fact table").

As to claim 8, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Lindsay et al. teach:

"wherein said optimization module is adapted to commit an optimal number of logical nodes for push down to said fact table" (see [column 5, lines 20-30], [column 7, lines 20-35] and [column 8, lines 25-54] wherein query optimizer is equivalent to Applicant's "optimization module", each snowflake is equivalent to Applicant's "logical node" and the including of snowflake in the plan as disclosed is equivalent to Applicant's "push down to said fact table").

As to claim 9, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Lindsay et al. teach:

"wherein the step of creation of said logical node reduces a snowflake schema to a star schema" (see [column 6, lines 39-45], [column 7, lines 45-55] and Fig. 6 wherein each snowflake including a candidate snowflake root and snowflake subnodes is equivalent to Applicant's "logical node", and a fact table connecting to a set of snowflakes presents a star schema).

As to claim 10, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said optimization module comprises means for calculation of a cumulative selectivity for said logical node” (see [column 7, lines 5-15] where weight of a matching index is equivalent to Applicant’s “cumulative selectivity” and snowflake including snowflake root table and snowflake subnodes is equivalent to Applicant’s “logical node”).

As to claim 11, this claim is rejected based on arguments given above for rejected claim 10 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said calculation means includes a presentation of all selectivities for all dimension tables in said logical node” (see [column 7, lines 5-15] wherein selectivity of all the join predicates is equivalent to Applicant’s “all selectivities for all dimension tables”).

As to claim 12, this claim is rejected based on arguments given above for rejected claim 7 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said logical node reduces search space traversal” (see [column 7, lines 45-65] wherein the disclosure of including only subnodes having filtering effects implies the reduction of search space traversal as illustrated in Applicant’s claim language).

As to claim 13, Lindsay et al. teach:

“A article” (see [column 4, lines 35-45]) comprising:

“a computer-readable medium” (see [column 5, lines 30-40]);

“means in the medium for storing data in a relational database having fact table and at least two child dimension tables, wherein said tables are organized in a snow flake query configuration” (see [column 4, lines 65-67], [column 6, lines 3-15], and Fig. 6 wherein a fact table connected to many levels of dimension tables as disclosed is equivalent to Applicant’s “snow flake query configuration”);

“means in the medium for reducing the snow flake configuration to a star configuration by combining a first generation child dimension table rooted at the fact table and all subsequent dimension tables rooted at said first generation child dimension table into a logical node” (see [column 6, lines 10-20], [column 7, lines 45-55] and Fig. 6 wherein each snowflake including a snowflake root node (R) and snowflake subnodes (A, B, C and D) is equivalent to Applicant’s “logical node”, and a fact table connected to a set of snowflakes presents a star schema);

“means in the medium for determining commitment of said logical node for push down to said fact table” (see [column 7, lines 20-67] and [column 8, lines 1-60] wherein snowflake is equivalent to Applicant’s logical node); and

“means for pushing down said logical node to said fact table responsive to a positive commitment” (see [column 7, lines 20-67] and [column 8, lines 1-60] wherein snowflake is equivalent to Applicant’s logical node, and the including the snowflake in the query plan or minimum spanning tree is equivalent to Applicant’s “push down to said fact table”).



As to claim 14, this claim is rejected based on arguments given above for rejected claim 13 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein the medium is a recordable data storage medium” (see [column 5, lines 30-60]).

As to claim 15, this claim is rejected based on arguments given above for rejected claim 13 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said means for determining commitment of said logical node for push down to said fact table includes committing an optimal quantity of logical nodes for push down to said fact table” (see [column 5, lines 20-30], [column 6, lines 40-67] and [column 8, lines 25-54] wherein query optimizer is equivalent to Applicant’s “optimization module”, each snowflake including a snowflake root node and snowflake subnodes is equivalent to Applicant’s “logical node” and the including of snowflake in the plan as disclosed is equivalent to Applicant’s “push down to said fact table”; and determining the set R(match) from the set R(candidate) and generating the minimum spanning tree using tables in the set R(match) indicates that only optimal quantity of snowflake root tables along with its subnodes (logical nodes) are pushed down, as illustrated in Applicant’s claim language).

As to claim 17, this claim is rejected based on arguments given above for rejected claim 13 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said means for determining commitment of said logical node for push down to said fact table includes means for calculating a cumulative selectivity for said logical node” (see [column 7, lines 5-15] where weight of a matching index is equivalent to Applicant’s “cumulative selectivity”, and each snowflake including a snowflake root table and snowflake subnodes is equivalent to Applicant’s “logical node”).

As to claim 18, this claim is rejected based on arguments given above for rejected claim 17 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said means for calculating a cumulative selectivity for said logical node includes a presentation of all selectivities for all dimension tables in said logical node” (see [column 7, lines 5-15] wherein selectivity of all the join predicates is equivalent to Applicant’s “all selectivities for all dimension tables”).

As to claim 19, this claim is rejected based on arguments given above for rejected claim 13 and is similarly rejected including the following:

Lindsay et al. teach:

“wherein said means for determining commitment of said logical node for push down to said fact table includes mitigation of search space traversal” (see [column 7, lines 45-65] wherein the disclosure of including only subnodes having filtering effects implies the reduction of search space traversal as illustrated in Applicant’s claim language).

*Conclusion*

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong-Thao Cao whose telephone number is (571) 272-2735. The examiner can normally be reached on 8:30 AM - 5:00 PM (Mon - Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Rones can be reached on (571) 272-4085. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PTC

August 24, 2006

*Luke S. Messum*  
Primary Examiner  
Art Unit 2167